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NOTES ON GEOGRAPHIC DISTRIBUTION

Notes on the southernmost record of Pacific Beakfish, *Oplegnathus insignis* (Kner, 1867) (Perciformes, Oplegnathidae)

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Abstract. A unique specimen of Beakfish, *Oplegnathus insignis* (Kner, 1867), was captured off the coast of Chañaral as a bycatch in a fishing net in northern Chile, extending its known range in Chilean territory by 370 km to the south. This study discusses the significance of this geographical extension for the establishment of local populations of the species associated to an inshore zone in the desert coast of northern Chile and for conducting further research to promote conservation of this species.

Key words. Atacama region, Chañaral, Chilean coast, Pacific Coast, San Pedro

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INTRODUCTION

The family Oplegnathidae currently contains a single genus comprising seven species which have a wide distribution, spanning distant geographical regions, such as the coasts of South Africa, Australia, South America, and Japan (Nelson 1984). The genus *Oplegnathus*, which was described by Richardson in 1840, includes *Oplegnathus insignis* (Kner, 1867), commonly known as San Pedro, Pejechancho, or Pacific Beakfish (Medina et al. 2004; Méndez-Abarca 2015; Méndez-Abarca and Pepe-Victoriano 2020). Adults of this species exhibits demersal habits, while juveniles may occasionally be temporary visitors to littoral pools, mainly in autumn and winter (Berríos and Vargas 2000). However, both adults and juveniles are relatively common in *Lessonia* kelp forests at depths of 3–30 m along the northern coast of Chile (Romero et al. 1984), adjacent to the Desert ecoregion of that country (Medina et al. 2004; Méndez-Abarca and Pepe-Victoriano 2020). This species' geographical distribution extends from the Galapagos Islands of Ecuador through Peru and Antofagasta Bay in northern Chile (Chirichigno 1974; Medina et al. 2004).

Oplegnathus insignis is an omnivorous fish which primarily feeds on macroalgae and small invertebrates (Grove and Lavenberg 1997; Berríos and Vargas 2004). In captivity, have consumed a variety of food, including live brine shrimp, crustaceans, and shellfish, and they can adapt gradually to commercially designed dehydrated feeds for marine fish (Méndez-Abarca 2015; Muñoz et al. 2015). This species undergoes a drastic chromatic change over its life span. Juveniles exhibit a yellow background color with six overlapping black stripes. In contrast, in adults the body color is dark brown (Moreno and Castilla 1980). This phenomenon is also observed in other species with which it coexists, such as *Scartichthys viridis* (Valenciennes, 1836) (Reyes and Hüne 2012), *S. gigas* (Steindachner, 1876) (Méndez-Abarca and Mundaca 2016; Delrieu-Trottin et al. 2021), and *Nexilosus latifrons* (Tschudi, 1846) (Méndez-Abarca et al. 2023).

Historically, inshore fishes like *O. insignis* and other large species, such as *Graus nigra* Philippi, 1887 and *Semicossyphus darwini* (Jenyns, 1842), have been targeted for recreational purposes after the introduction of spearfishing in the 1950s. Over time, as spearfishing intensified and new markets opened, it became an important commercial activity, leading to the overexploitation (Godoy et al. 2010). While reliable data are sparse, non-official sources of information such as spearfishing and fishermen's anecdotes suggest that spearfishing, similar to traditional fishing (Castagnino et al. 223), has a high impact on fish populations, posing a considerable threat to the conservation of the Chilean coastal fish fauna. Within this context, we document the finding of a specimen of *O. insignis*, captured on a sandy beach in the city of Chañaral, Atacama Region, Chile. It was caught accidentally in an artisanal fishing net in November 2022. This find extends the species' geographical distribution by 370 km to the south.

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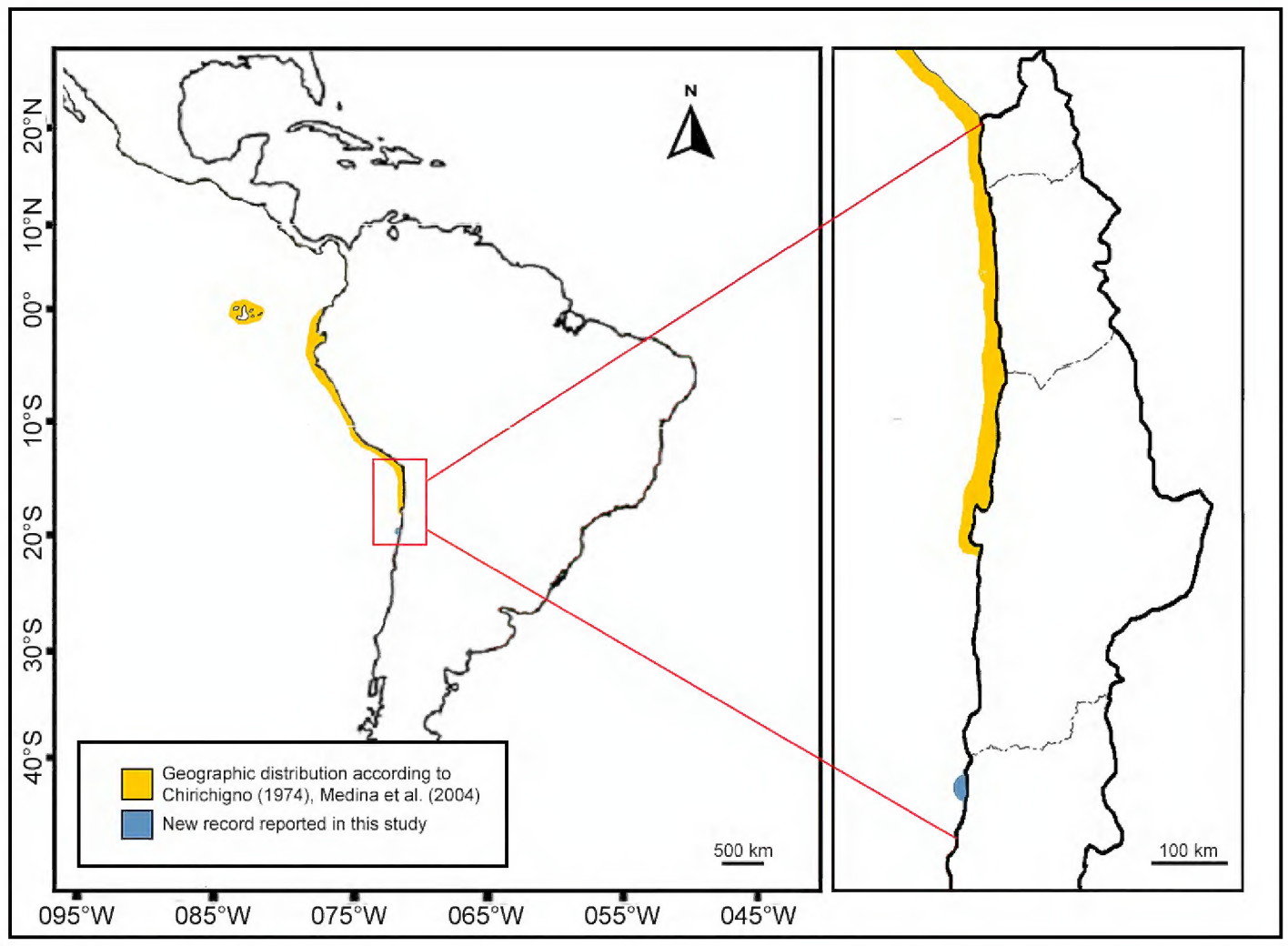

Figure 1. Distribution of *Oplegnathus insignis* along the Pacific coast of South America showing natural distribution and the new records of the species: geographic description as described by (A) Chirichigno (1974); Medina et al. (2004) and (B) the new record from Chañaral, Chile.

METHODS

An individual of *Oplegnathus insignis* was accidentally captured on November 13, 2022, as bycatch of fishing activities targeting *Cilus gilberti* (C.C. Abbott, 1899) and *Cheilodactylus variegatus* (Valenciennes, 1833) in an artisanal fishing net at a depth of 3 m in the Poza Barquito area, off the coast of the city of Chañaral (Atacama Region), Chile (Figure 1). The specimen was taxidermied for preservation and photographed. The taxidermy process involved removing the fish's skin with a scalpel, applying sodium borate to it; mounting the specimen on a polyurethane mold. Fins were then fixed with clamps, and the specimen was placed in a taxidermy oven for 90 minutes at 45 °C. The prepared specimen is deposited in the marine fish collection at the Proyecto Vida Salvaje Museo Vivo, belonging to the Fundación Reino Animal (FRA), Arica, Chile.

RESULTS

***Oplegnathus insignis* (Kner, 1867)**
Figure 2

New records. CHILE – **Atacama Region** • Chañaral, Poza barquito sector; 26°20′52″S, 070°37′21″W; 3 m depth; 13.XI.2022; F. Méndez-Abarca leg.; incidentally caught in artisanal fishing nets; 1 specimen, juv., sex indet., COLECIC0399FRA.

Identification. The identification of the specimen was based on meristic and morphometric characters as described by Medina et al. (2004). The specimen has a body length of 326 mm.

Anal fin with three spines, dorsal fin continuous or highly notched, rarely divided into two parts, usually with seven or more spines. Teeth of the jaws fused forming a continuous plate or beak. Juvenile with black and yellow vertical bands (which change to a reticulated pattern in adults). The morphological features match those provided by Medina et al. (2004).

DISCUSSION

The documented geographical distribution of *Oplegnathus insignis* extends from the Galapagos Islands in Ecuador to Antofagasta in Chile (Chirichigno 1974). The discovery of a specimen captured off the coast of Chañaral expands this distribution by about 370 km.

It is plausible to suspect that the presence of *O. insignis* in northern Chile may be the result of the presence of warmer waters linked to El Niño, which might have facilitated the dispersal of this species toward a temperate latitude. While no El Niño conditions were reported for November 2022, *O. insignis* may have extended its range during previous El Niño events, when warmer-water conditions are more favorable for *O. insignis*. We can assume that *O. insignis* is a frequent inhabitant of inshore areas on the northern coast

Figure 2. *Oplegnathus insignis* collected in Chañaral, Chile. Scale bar = 4 cm.

of Chile, such as Antofagasta, and that a persistent population of *O. insignis* is established in the area. Alternatively, the presence of this species may be due to unintended escapes from nearby experimental cultures (e.g. Segovia et al. 2012; Tapia et al. 2012) and not necessarily linked to an oceanographic anomaly. Our find, however, aligns with observations made during recent decades where several fish species have been newly recorded along the Chilean mainland coast. Examples include *Pseudocaranx chilensis* (Guichenot, 1848) (Béarez and Villaroel 2018), *Sphyraena ensis* Jordan & Gilbert, 1882 (Méndez-Abarca et al. 2024) and *Galeichthys peruvianus* Lütken, 1874 (Méndez-Abarca et al. 2021). These records are examples of documented shifts in marine biodiversity, possibly linked to oceanographic changes and/or human-induced factors like overfishing and climate change. Given the uncertainty of the cause of the expanding distribution of *O. insignis*, further investigation is needed to offer a clearer insight to explain its presence in this geographic area and also to determine if the habitats occupied differ from those described, for example, for populations in the Galapagos Islands.

Oplegnathus insignis should be considered a species of conservation concern due to fishing threats and the unknown status of its population on the northern coast of Chile. As previously mentioned, this species is under pressure by overfishing and the lack of reliable data related to artisanal and recreational fishing, including spearfishing. Also, unreliable data can lead to the normalization of population decline or prevent the recognition of decline (Castagnino 2023), allowing overfishing to become a threat for inshore populations in Chile.

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ADDITIONAL INFORMATION

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

No ethical statement is reported.

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Author contributions

Conceptualization: FMA. Writing – original draft: FMA, RPV. Writing – review and editing: FMA, RPV, EAM. Investigation: FMA. Resources: FMA. Visualization: EAM.

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Data availability
All data that support the findings of this study are available in the main text.

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